

CONTINUOUS IMPROVEMENT PROJECT DATABASE

DIVISION 4 PROJECTS

Project Name	Project Description	Division	Project Year	Contact Name	Contact Number	Project Category
Rescue of US70 West of Kinston	Proposed removal of 1 mile of west-bound 2-lanes of US 70 west of Kinston would involve \$100,000 costs, extensive obliteration/construction time and inconveniences to affected local businesses and workforces. Suggestions have been forwarded to Wilson construction Office, Division 4 to revise plan designs to retain and slightly adjust down-graded portion of US 70. Currently awaiting review, evaluation and possibly redesign by NCDOT engineering staff as a value engineering proposal.	Div 4	2009	Jonathan Barnes		Dollar Savings
Utility Savings	In the past NCDOT has been charged water and sewer rates for all the water used at the Selma Rest Area, located on I-95 in Johnston County. In an effort to reduce costs separate water meters were installed at each building at the site. These meters reflected the amounts of water used and amounts that would discharge into the sanitary sewer. An agreement was made with the Town of Selma to separate the billing rates. During the first full year of use, NCDOT was able to save \$4,197.50 for water not charged with sewer rates.	Div 4	2009	George Harrell	(252) 237-6164	Dollar Savings
Spills are no Thrill	The herbicide crew needed a place to park their application equipment and store inventory in a manner that would contain any type of spills. This would prevent stormwater contamination and protect the environment. The solution was to design and build a structure with an integral collection system in the floor. This allowed collection for reuse of any product that may spill from inventory or the application vehicles. A storage facility for product inventory and a four bay building with integral floor drains was constructed. These floor drains accumulate in a sump where it is pumped to a collections tank for reuse. The structure was also designed with radiant heaters to prevent freezing of the application vehicle plumbing. This was a secondary benefit from having an enclosed collection pad.	Div 4	2009	J.C. Duckworth	(252) 237-6164	Energy and Environment
Welcome Center Waterless Urinals	Problem: Because of the severe drought in North Carolina, Governor Easley asked all state agencies to reduce water usage at all state facilities. The Northampton County Welcome Center uses 5.45 million gallons of water per year. It has 10 urinals, 44 commodes and 24 sinks. This facility provides service for over 2.2 million people a year. Solution: We installed 10 water free urinals at the Welcome Center at a saving of 980,460 gallons of water per year.	Operations- Division 4	2007	Steve Hamill	(252) 237-6164	Dollar Savings
Utility Savings	Problem: In the past NCDOT has been charged water and sewer rates for all the water used at the Selma Rest Area, located on I-95 in Johnston County. Solution: Separate water meters were installed at each building at the site. These meters reflected the amounts of water used and amounts that would discharge into the sanitary sewer. An agreement was made with the Town of Selma to separate the billing rates.	Operations - Division 4	2006	Robert Simpson	(252) 237-6164	Dollar Savings
Brantley Vise	Problem: The problem was to eliminate the risk of equipment damage and/or personal injury from routine handling of the 50-pound weights used to secure the volumeter during density tests for embankments. Solution: An employee in Division 4, Resident Engineer's Office - Wilson, designed and fabricated a portable, lightweight volumeter/molding securing vise, weighing only 11 pounds. This device was named the "Brantley Vise. This devise has a simple design, is relatively inexpensive, and is easy to fabricate.	Operations – Division 4	2006	Dennis Brantley	(252) 237-6164	Safety Improvement
Pipe Database	In order to plan the maintenance of anything, one must know the quantity of the asset and its condition. It was not known how many crossline pipes exist in our district or their condition. Information was gathered and entered into a database. The database includes a button that looks up the site on topo maps using GPS coordinates that are included in the database. The button provides a location map and environmental assessment of the site. It also allows use of GIS software to view the data. Pictures can also be pulled into the database, allowing one to see the site without having to visit or search through a stack of photos.	Operations- Division 4	2005	F. Enders	(252) 583-5861.	Cycle Time Reduction

Better Safety Meetings	<p>Incident reports are generated every month based on incidents and injuries that have occurred over the previous month. A committee involving employees from the area in which the incident occurs reviews these incidents and injuries and forwards their recommendations to the division safety meeting. Reports completed in the field have the advantage of being familiar with the area in which the incident occurs.</p> <p>To adequately review incidents at the division level, a PowerPoint presentation was developed to show every incident and injury that has occurred. Pictures from every incident and injury are taken soon after the incident has occurred to view the location, damage and possible causes of the incidents. Corrective action(s) can be determined after review. After the incident review meeting, the employees' names are removed from the PowerPoint and it is shown at the safety meeting.</p>	Operations-Division 4	2005	Deborah Leonard	(252) 237-6164	Safety Improvement
CARS & HP320 Pilot Project	Currently, CARS is used to track citizen concerns by NCDOT and Form HP320 is used by the Highway Patrol to track citizen complaints about highways and rights of way. The HP320 is sent to DOT to address the problem and the back of form is completed and returned to Highway Patrol after issue is resolved. New process allows SHP to enter info directly into CARS instead of HP320. Old process took approximately 4 weeks to turn around, while new process provides real-time notification to appropriate unit and allows DOT to respond to issues in more timely manner.	Operations Div 4&7	2003	Debbie Leonard	(252)237-6164	Customer Service
Guardrail Tagging System	With the increase in installation of guardrail and cable guide-rail, comes the increase in rail damage due to vehicle crashes. In order for the State to be compensated for this damage, a responsible party must be identified and billed. Notification of damage is the 1st step. A collision report (DMV-349) is filled out by the law enforcement agency. The reports locate the damaged property in order for an estimate to be prepared. At times, this can be difficult and dangerous due to high-speed roadways with high volume of traffic. The team has developed a tagging system in which the investigating officer tags the damage at time of the crash. The tag is waterproof and secured by flex ties, bright yellow and orange in color, so it can be easily seen by DOH employees. The tag contains the basic information necessary to identify the responsible party. The tag also contains an estimated length of damage which enables DOH to properly begin the billing process by estimating the repair cost for the billing form (Form 990). Tags can also be located prior to a written report being received and called in to the local county maintenance facility to speed up the billing process and to expedite repairs.	OPERATIONS - DIVISION 4	2002	Debbie Leonard	(252) 237-6164.	Cycle Time Reduction
Moving Shoulder Reconstruction Operation	Repairing low shoulders after a road was resurfaced was both to haul in the material and use a grader to level out the dirt, or use a grader mounted disk to pull up existing shoulder dirt. Use of the disk is better if the drop is less than 5", over that would not pull up enough. Equipment used is the grader with a mounted disk, an additional grader to kick off any dirt that is pulled onto the pavement, a broom tractor to sweep the pavement clean, a crew cab gang truck and 2 flaggers. A truck mounted attenuator at the back of the caravan with a "Slow Moving Traffic Ahead" sign and other advanced warning signs was utilized using one less employee. The caravan moves down one side of the road to the end of the workzone, turns around, and comes down the other side. They turn around and go to the next workzone. By this time, the crew leader will have the signs moved and the operation can continue.	OPERATIONS - DIVISION 4	2002	Chris Pendergraph	(919)934-6176.	Cycle Time Reduction
Lime	In the past Division Four used bagged lime for application to wildflower beds. This process was used because many of the sites were small and spread throughout the Division. Bag costs averaged \$73.20 per ton. Bulk suppliers were contacted to determine if they could apply bulk lime with a continuous sequence. The supplier was met at a central location, led to the multiple sites, informed of the application rates at each site, and allowed to move from site to site for application.	OPERATIONS - DIVISION 4	2002	Brian Glover	(252) 237-6164.	Dollar Savings
Dump Truck Canvas Stop	It is the goal of the Halifax Equipment Shop to keep the amount of unnecessary repairs to a minimum and keep the equipment on line or rented. There is currently an L-shaped bracket at the top/rear of the dump truck that is fastened to the body to receive the canvas rollback bar to cover the load. The position of the L-bracket is easily damaged while loading or unloading. There was an apparent need to improve this process and relocate the angle instead of just continuing to repair the damaged L-bracket. The action that was taken was to remove the L-bracket and attach a 3/8 angle near the fulcrum of the rollback bar, which is located just to the rear center of the truck body. This stop is less susceptible to damage.	OPERATIONS - DIVISION 4	2002	Joe Nelson	(252) 583-4221.	Dollar Savings

Pin Driver	Currently, sledgehammers are used to drive pins for ABC nuclear density tests. This process is time-consuming, labor intensive, and can create unsafe working conditions. The CPI team in the Wilson Resident Engineer's Office of Division 4 proposed the use of a demolition hammer to drive these pins. For trial purposes, the team borrowed all the equipment needed from the Division 4 equipment shop. That equipment included a portable generator, a demolition hammer, and a ground rod bit. They ran the test using a demolition hammer on 10 test sections that include 5 holes each for a total of 50 holes. The readings from each of these holes were compared to an adjacent hole that was prepared using the conventional method of driving the pin with a sledgehammer.	OPERATIONS - DIVISION 4	2002	John Finnell	(252) 237-6164	Safety Improvement
Overhead Power Line Covers	Backing up trucks with raised beds and leaving a dumpsite with a raised bed often results in the bed coming in contact with overhead power lines. In fact, approximately 17% of construction accidents with dump trucks involve electrocution. NCDOT has also had problems with equipment such as cranes, backhoes, and boomed equipment coming in contact with power lines. In order to ensure safety of workers, Division Four purchased covers that are lime-yellow in color to fit over a 28 traffic cone. These cone covers can also be used with the 36 cones that are already in stock.	OPERATIONS - DIVISION 4	2002	Deborah Leonard	(252) 237-6164.	Safety Improvement
Portable Shade Tree	When mechanics work on equipment that has broken down on the road, it is often in extreme heat and direct sunlight. This often leads to heat exhaustion, fatigue, sunburn, and using tools that are extremely hot. This situation lead to the development of the Portable Shade Tree. This is an umbrella that is mounted on a magnet that can be easily attached to a piece of equipment. Using the wing nut attached to the mounting bracket and repositioning the magnet, this portable shade tree can be positioned in any direction to counter the angle of the sun to provide shade.	OPERATIONS - DIVISION 4	2002	Joe Nelson	(252) 583-4221	Safety Improvement
I-95 Welcome Center Parking Notification in Northampton County	An on-going problem was identified involving excessive overnight trucker parking at the I-95 Welcome Center (southbound) in Northampton County, just south of the NC/VA State line. The truck parking lot at this facility has nineteen marked spaces. Actual counts of parked trucks were taken at random times overnight, and revealed that routinely there were as many as 50-60 trucks. Trucks were parked along grassed or soiled shoulders, exit and entrance ramps, and curb and gutter sections. The problems created involve safety and maintenance issues. A work group was formed to address the problem and offer suggestions for improvements. Several permanent, long-range solutions were suggested but with funding uncertainties, a short-term pilot project was decided upon for implementation. The pilot project recommendation consisted of placing a portable trailer-mounted Changeable Message Sign (CMS) along I-95 southbound, in Virginia, in advance of the Welcome Center for notification to truckers that no parking spaces are available.	OPERATIONS DIVISION 4	2001	Steve Hamill	(252) 237-6164	Customer Service
Encroachment Computer Program	Processing encroachment agreements in the District office was very time consuming. After the plans were approved, the Assistant District Engineer had to fill out a paper form with all of the information for the agreement, note all of the provisions and carbon copies required, and then log the agreement into a diary. The secretary would type up the agreement, which consisted of a transmittal letter to the Division Office, an agreement contract to the applicant, and usually two pages of provisions. The Assistant District Engineer would then proof the letters and give them to the District Engineer for signature. The processing time for encroachment agreements was usually two weeks. In order to lessen this time an Encroachment Computer Program was created. With this program, the data for the encroachment agreement is logged into a computer and, instead of filling out a paper form, provisions for the agreement are chosen on the computer by the simple click of a mouse button. Then the whole agreement, including the transmittal letter, the agreement contract to the applicant and all provisions, is printed in one step	OPERATIONS DIVISION 4	2001	Chris Pendergraph	(919) 731-7938	Cycle Time Reduction
Wasted Stone on Secondary Road Construction Projects	For Secondary Road Construction Projects (SRCP), the roads that are prepared for paving end up with a considerable amount of segregated stone that is typically kicked to the shoulder of the road. Not only is the stone wasted, but also in locations where people live the stone presents a problem for people trying to maintain their yard and shoulders of the road in their yard with stone scatted on the shoulder. This innovation is not time consuming or difficult to perform. A rubber tire loader or a force-feed loader and trucks are the only additional equipment needed. The finished road is a much cleaner job without the stone cast on the shoulder of the road. Instead of kicking the stone on the shoulder, the rubber tire or force-feed loader can pick up the windrow of segregated stone. This stone can either be used on driveways on the job to prevent haul cost on can be stockpiled in the yard for later use on driveways	OPERATIONS DIVISION 4	2001	Danny Rackley	(252) 459-2762.	Dollar Savings

Environmental Program Coordination	<p>Division Four is faced with increased need for environmental compliance, coordination and notification for maintenance activities in the Division. This need was made even greater with the introduction of Buffer requirements for the Neuse and Tar River and the maintenance activities stemming from hurricane-related flooding.</p> <p>The Division Engineer, and the new Division Environmental Officer (DEO), formed a team comprised of the DEO, Assistant District Engineers from the three districts and the Bridge Maintenance Supervisor. The Assistant District Engineers and Bridge Maintenance Supervisor were designated as District Environmental Coordinators (DECs) and were assigned to help environmental coordination efforts underway by the DEO.</p>	OPERATIONS DIVISION 4	2001	Robin Little	(252) 237-6164	Environmental Sustainability
Flexi-Guide 300 Curb System	<p>"Gate running" at gated railroad crossings has been identified as a major problem across the nation. The NCDOT Rail Division has been using curb systems at railroad grade crossings where motorized gate arms are used and where the potential for gate running exists. The Flexi-Guide 300 Curb System was installed on May 16, 2001 at NC 42 and US 70 in Clayton, NC. Due to heavy traffic volumes and anticipated future growth in traffic volume at this intersection, the Flexi-Guide 300 Curb System was intended to deter motorists from driving around the gate crossing. The unique design of this new system combines strong color conspicuity, excellent reflectivity, and visual structure to provide an effective 24/7 deterrence to gate running. This system can easily be removed and re-bolted to the road surface when resurfacing is required. The Flexi-Guide 300 Curb System can also be used as an effective traffic-calming device in neighborhoods, as a traffic roundabout, and as a positive means for separating traffic moving in the same or opposite directions.</p>	OPERATIONS DIVISION 4	2001	Sid Tomlinson	(252) 237-6164	Safety Improvement
Mobile Concrete Transport Unit	<p>Using one 6.0 c. f. wheelbarrow or two 12-quart buckets (weighing approximately 60 pounds each) in transporting a heavy load of concrete from a concrete truck or a concrete pump truck to the concrete testing location can lead to serious back injuries.</p> <p>The construction unit in Division 4 fabricated a Mobile Concrete Transport Unit (MCTU) container using scrapped aluminum highway signs obtained from the NCDOT Division 4 Traffic Services Unit. The dimension of the container can be adjusted to accommodate whatever type of hand truck is used and does not have to be permanently attached to the hand truck. The signs can be obtained from the Division Traffic Services Office and can be welded together by any certified welder. The MCTU can be used by anyone who has to transport concrete for testing</p>	OPERATIONS DIVISION 4	2001	Michael Biedell	(252) 237-6164	Safety Improvement
Procedures for Selective Vegetation Removal (SVR) Permit Processing	<p>In August 2000, the Division Roadside Environmental Departments (statewide) were given the responsibility of managing all aspects of the Selective Vegetation Removal (SVR) policies within the Outdoor Advertising Control Program. After a few weeks of learning the various aspects of the new responsibility by trial and error, it was determined that a written step-by-step process was needed in order to coordinate the responsibilities within the Division Four Roadside Environmental Department. A small work group was formed to review the entire process from start to finish, in accordance with the revised SVR policy and to develop the permit process.</p> <p>A written 30-step process was developed to cover most potential situations that may occur within the selective vegetation removal permit process.</p>	OPERATIONS DIVISION 4	2001	Don Smith	(252) 237-6164	Communications
NC-125 & NC-903 Rumble Strips	<p>When faced with having to repair rumble strips on NC-125 and NC-903 worn by traffic and snowplows, the Halifax Maintenance Yard began looking for a solution to having to bring in a unit from outside the maintenance yard to do this expensive work. Safety to the traveling public is compromised if these rumble strips fall into disrepair. When the accidents for three years before the rumble strips were originally installed are compared to the three years after installation, there was a noticeable reduction in preventable accidents.</p> <p>Employees at the Halifax Maintenance Yard in Division Four devised a plan to use a template to keep asphalt and 78M stone in place so it could be rolled. This was a less expensive solution than using thermoplastic, saving \$.82 per linear foot. This reduced the total cost by \$700, 37% savings. The use of a template to keep readily available stone and asphalt in place allows the maintenance yard to quickly repair rumble strips.</p>	OPERATIONS DIVISION 4	2001	Franz Enders	(252) 583-5861	Safety Improvement

Safer Intersection Work with Detours	<p>The Division 4 Construction office in Nashville needed to find a safer way to perform intersection work at NC 97 and Nashville Road in Rocky Mount. Due to the amount of traffic at this intersection, which included a significant number of tractor-trailer semis, minimizing the impact of intersection work on the traveling public while providing a safer work zone environment was essential. It was determined that a temporary road closure (one intersection leg at a time) and a temporary detour would greatly reduce exposure of workers to dangerous traffic. It would also reduce exposure of the traveling public to construction equipment, as well as eliminate intersection congestion.</p> <p>NCDOT and contractor personnel contacted the City of Rocky Mount to discuss the possibility of detouring traffic. Rocky Mount officials agreed that detouring traffic would be a safer approach; however, they also wanted to minimize the length of time the detour would be in place. The road closure for Nashville Road north of NC 97, as well as south of NC 97, was limited to one week each. Thus, the total detour time was two weeks.</p>	OPERATIONS DIVISION 4	2001	Lynn Raynor	(252) 459-2129	Safety Improvement
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